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Patentanmeldung Nr. Patent application No. Demande de brevet n°

03300047.2 ✓

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R C van Dijk



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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:  
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.  
If no title is shown please refer to the description.  
Si aucun titre n'est indiqué se referer à la description.)

VEHICLE

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**Vehicle**

The invention relates to a vehicle fitted with at least one taillight and a rear license plate to be illuminated.

5 Such a vehicle fitted with two taillights and a rear license plate to be illuminated is generally known. As a rule, the taillights of the known vehicle are each fitted with a incandescent lamp of about 5 to 10 Watt, whilst the rear license plate is often illuminated by at least two incandescent lamps, likewise of 5 to 10 Watt. As is usual, the taillights and the rear license plate lights are turned on and off simultaneously.

10 One drawback of the known vehicle is the fact that at least four low-output incandescent lamps are needed, as indicated above. Because of their low output, such incandescent lamps are often not very effective, whilst the installation thereof is laborious and has a cost-increasing effect.

15 The object of the invention is to obviate the drawbacks of the prior art, and in particular to provide a vehicle in which the effectiveness of the lamps used for lighting the rear of the vehicle is increased.

In order to accomplish that objective, a vehicle of the kind referred to in the  
20 introduction is characterized in that a light source for emitting a light beam to a light guide disposed beside the light source is provided, said light guide being provided with an input surface facing towards the light source for inputting at least part of the light beam from the light source, as well as with at least one output surface for outputting a light beam that is being passed through the light guide to the license plate and/or the at least one taillight. It is  
25 noted that the term "beside" is understood to mean any spatial orientation, such as below, above, on one side, etc. Preferably, the light source(s) of the taillight(s) will illuminate – via the lightguide – the license plate, whereas in the alternative the light source(s) of the license plate will illuminate – via the light guide – the taillight(s) of the vehicle. It is also possible that the light source(s) are located elsewhere, i.e. not being the light source(s) of the

taillight(s) or the license plate. The light guide in particular comprises at least two output surfaces, in which one output surface outputs part of the light beam that is being passed through said light guide to the license plate and in which the other output surface outputs part of the light beam that is being passed through said light guide to the taillight. As a result of  
5 this arrangement it is no longer necessary to provide separate lamps for each function, viz. taillight(s) and rear license plate lights, as was previously the case, but one or more lamps function both as the taillight(s) and as the license plate lights. Thus, a lamp may emit a light beam, part of which is directly used for the taillight, whilst another part is passed to the  
10 license plate via the light guide for the purpose of illuminating said license plate. According to another possibility, the light beam emitted by the lamp is passed both to the taillight and to the license plate via the light guide. In all the above cases, the taillights and the license plate lights are turned on and off simultaneously.

International patent publication no. WO 99/06760 (SDL, Inc.) discloses a vehicle with a plurality of individually addressable semiconductor laser light sources each  
15 producing a beam of light, wherein said light sources are optically coupled to fiber optic waveguides. The laser light sources are grouped together at a single location within the vehicle for easy access and conveniently located within the vehicle. Said fiber optic waveguides distally transmit the light beams to the brake lights, taillights, instrumentation lights and turn lights of the vehicle. A disadvantage of this known vehicle is that each laser  
20 light must be individually switched on or off, with all electrical complications involved, whereas quite a number of fiber optic waveguides are necessary within the vehicle. Further, a central location of the group of laser lights in practice appears to be cumbersome and even undesirable, particularly when said location is damaged in the event of a collision.

In one preferred embodiment of the vehicle according to the invention, the  
25 light guide is in part disposed in front of the license plate. In particular, the part of the light guide that is disposed in front of the license plate is transparent.

In another preferred embodiment of a vehicle according to the invention, the part of the light guide that is disposed in front of the license plate comprises means for directing the light beam that is being output from the output surface at the license plate. Such  
30 optical directing means in particular comprise a mirror or a lens.

In another preferred embodiment of a vehicle according to the invention, the light guide is arranged in part near a transversal or longitudinal edge of the license plate. Also in this case, the part of the light guide that is disposed near the edge of the license plate

particularly comprises means (in particular mirrors or lenses) for directing the light beam that is being output from the output surfaces at the license plate.

In another preferred embodiment of a vehicle according to the invention, the vehicle comprises at least two taillights. Particularly, the two taillights each comprise a lamp, for example, which lamps also illuminate the rear license plate via the light guide. In another preferred variant, a lamp is used which provides the light for the taillights as well as for the license plate via the light guide.

In another preferred embodiment of a vehicle according to the invention, the light source comprises a LED (light emitting diode). It would then be possible to use red LED's and white LED's close together, wherein the red LED's are used for the taillights and wherein the white LED's are used for illuminating the license plate, all via the light guide.

The invention also relates to a light guide apparently suitable for use in a vehicle according to the invention.

15

The invention will be explained in more detail hereinafter with reference to Figs. illustrated in a drawing, in which:

Figs. 1 and 2 are schematic side elevations of a first and a second embodiment of a lighting system for use in the vehicle according to the invention;

Fig. 3 is a top plan view of the lighting system of Fig. 2;

Figs. 4 and 5 are schematic side elevations of a second and a third embodiment of a lighting system for use in a vehicle according to the invention;

Fig. 6 is a schematic side elevation and bottom view of coupled light guide components; and

Fig. 7 is another bottom view of coupled light guide components.

Fig. 1 shows a lighting system, which comprises a taillight 1 provided with a light source 2 in the form of a LED (light emitting diode), for example, and a reflector 1 for reflecting a light beam emitted by the LED rearwards in the direction of traffic coming up from behind. A light guide 4 is disposed beside the LED. The light guide 4 has an input surface 5 facing towards the LED for inputting part of the light beam from the LED, as well as an output surface 6 for outputting the part of the light beam that is being passed through the light guide to a license plate (not shown).

Fig. 2 shows a lighting system similar to the system that is shown in Fig. 1, with corresponding parts being indicated by the same numerals, with this understanding that the light guide 4 consists of two portions 4' and 4". The portion 4' has an input surface 5 for inputting the light beam from the LED and an output surface 6' for outputting (by means of mirrors 7) part of the light beam that is being passed through the light guide portion 4' to the taillight 1. The light guide portion 4", which is mounted in line with the light guide portion 4', likewise has an output surface 6" for guiding and subsequently outputting part of the light beam that is being passed through the light guide portion 4' to the license plate 8. The light guide portion 4" is in part mounted in front of the license plate 8.

Fig. 4 corresponds to Fig. 3, with corresponding parts being indicated by the same numerals, with this understanding that the portion 4" of the light guide 4 is in part disposed near a longitudinal edge of the license plate 8. Also in this case mirrors 7 are used for directing the light beam that is being output from the output surface 6" at the license plate 8.

Fig. 5 shows a lighting system in which a light source 2 is positioned centrally between the portions 4', 4" of the light guide 4, in which the light source 2 is further bounded by mirrors 7 for the purpose of passing a light beam emitted by the light source 2 through the light guide portions 4', 4" in the direction of the taillight 1 on the one hand and the license plate 8 on the other hand, and that with minimal losses.

Fig. 6 shows two coupled portions 4', 4" of the light guide 4 in side elevation and in bottom view, respectively. The coupled portions 4', 4" comprise an overlapping portion 9 for inputting a light beam emitted by the light source 2 via the overlapping portion in an efficient manner. Fig. 7 shows a bottom view of another design of partially overlapping portions 4', 4" of the light guide 4.

It is noted that the invention is not limited to the illustrated embodiments, but that it also extends to other variants that fall within the scope of the appended claims.

## CLAIMS:

1. A vehicle fitted with at least one taillight and a rear license plate to be illuminated, characterized in that a light source for emitting a light beam to a light guide disposed beside the light source is provided, said light guide being provided with an input surface facing towards the light source for inputting at least part of the light beam from the light source, as well as with at least one output surface for outputting a light beam that is being passed through the light guide to the license plate and/or the at least one taillight.

5 2. A vehicle according to claim 1, wherein the light guide comprises at least two output surfaces, wherein one output surface outputs part of the light beam that is being passed  
10 through said light guide to the license plate and wherein the other output surface outputs part of the light beam that is being passed through said light guide to the taillight.

15 3. A vehicle according to claim 1 or 2, wherein the light guide is in part disposed in front of the license plate.

4. A vehicle according to claim 3, wherein the part of the light guide that is disposed in front of the license plate is transparent.

20 5. A vehicle according to claim 3 or 4, wherein the part of the light guide that is disposed in front of the license plate comprises means for directing the light beam that is being output from the output surface at the license plate.

25 6. A vehicle according to any one of the preceding claims 1 - 5, wherein the light guide is arranged in part near an edge of the license plate.

7. A vehicle according to claim 6, wherein the part of the light guide that is disposed near the edge of the license plate particularly comprises means for directing the light beam that is being output from the output surfaces at the license plate.

8. A vehicle according to any one of the preceding claims 1 - 7, wherein said vehicle comprises at least two taillights.

9. A vehicle according to any one of the preceding claims 1 - 8, wherein said 5 light source comprise a LED (light emitting diode).

10. A light guide apparently suitable for use in a vehicle according to any one of the preceding claims 1 - 9.

**ABSTRACT:**

A vehicle fitted with at least one taillight (1) and a rear license plate (8) to be illuminated, a special feature being the fact that a light source (2) for emitting a light beam to a light guide (4) disposed beside the light source is provided, said light guide being provided with an input surface (5) facing towards the light source for inputting at least part of the light beam from the light source, as well as with at least one output surface (6) for outputting a light beam that is being passed through the light guide to the license plate and/or the at least one taillight.

Fig. 4

1/2

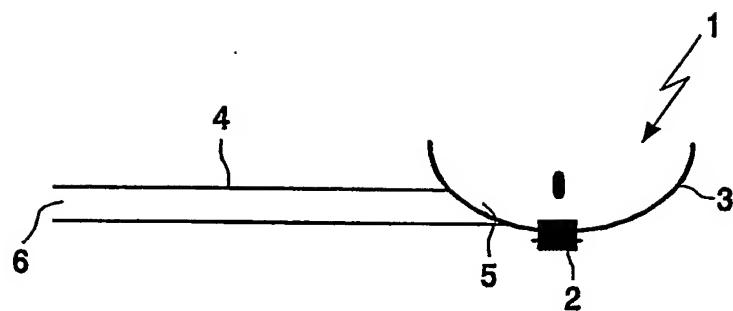


FIG. 1

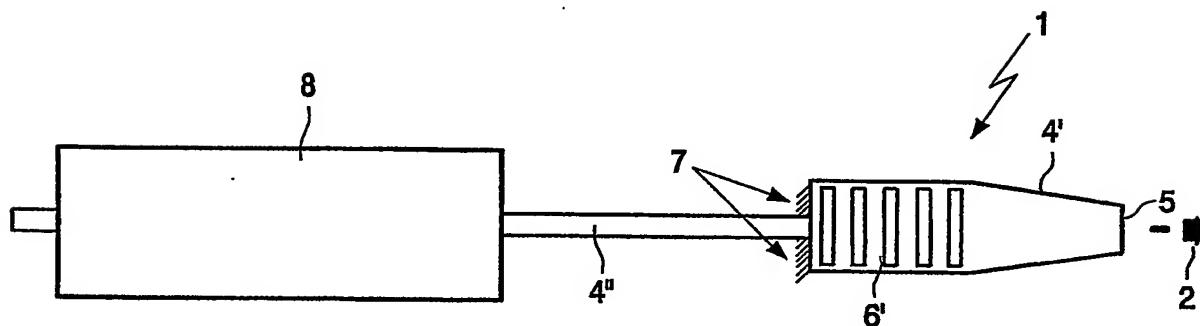


FIG. 2

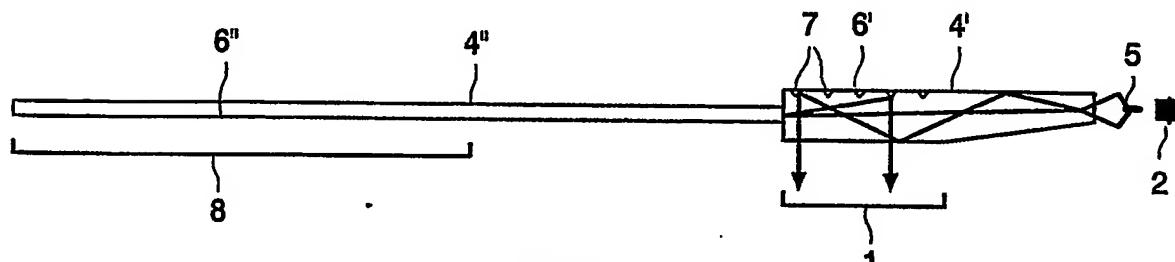


FIG. 3

2/2

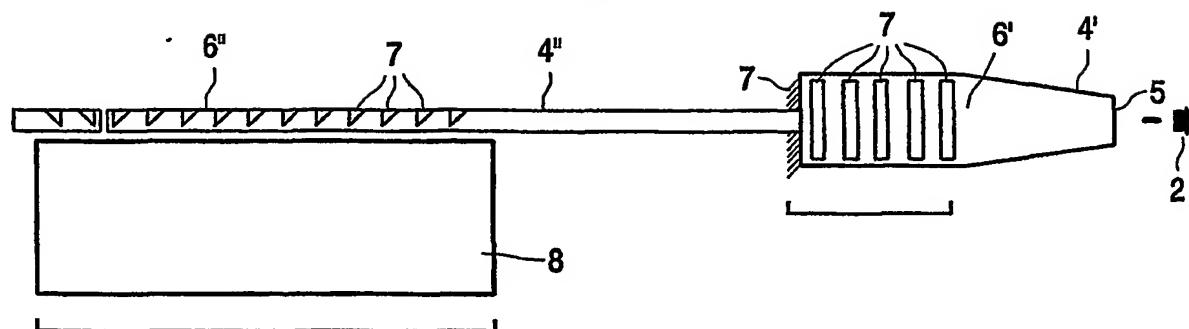


FIG. 4

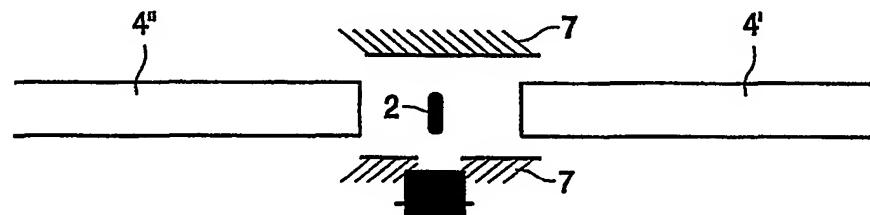


FIG. 5

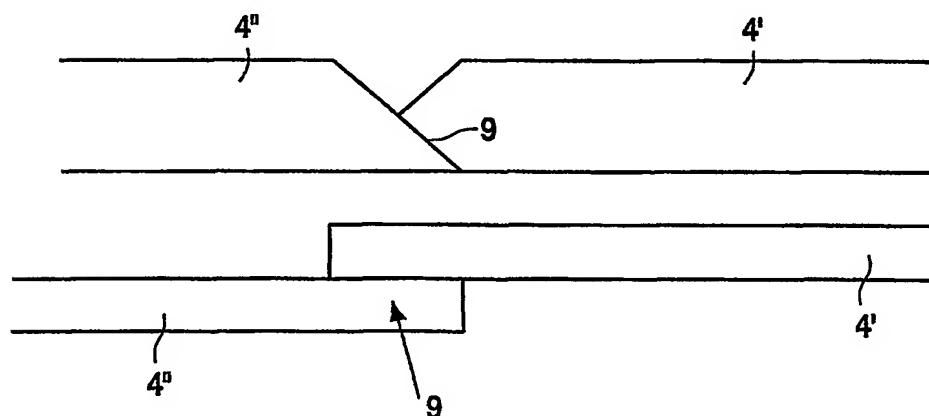


FIG. 6

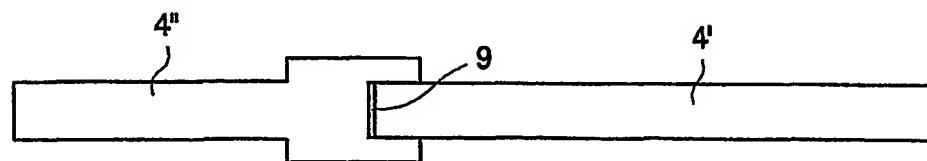


FIG. 7